Evidence for Direct Suspension of Loessial Soils

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Abstract

Dust emissions by high wind events have traditionally been modeled with saltation-based wind erosion processes. This approach gives generally good results when saltation-sized soil particles, 60 μm to 2 mm mean diameter, are present on the exposed soil surface. The Columbia Plateau, located in north-central Oregon and south-central Washington, is a region with extensive loess deposits where 90% of particles (by weight) have diameters less than 60 μm. During high wind events, large amounts of particulate matter are suspended. However, field surfaces may show little evidence of surface scouring or saltation, e.g. soil drifts, covered furrows, etc.. Wind profile analysis of two large, regional high wind events and additional data from a third event show evidence of direct suspension process where saltation is not a major mechanism for generating dust emissions. More intensive studies of the wind erosion process are underway to better understand and quantify the direct suspension mechanism.